AMENDMENTS TO THE SPECIFICATION

Please accept the following replacement paragraphs of the Specification, marked to show changes:

Paragraph 2:

Be it known that I, B. Ryland Wiggs, a citizen of the United States, residing at 214 Overlook Court, Suite 160, Brentwood, TN 37027, have invented a new and useful "~~Sealed Well Direct Expansion Heating and Cooling System, an~~ ~~Optional~~ Geothermal Heating and Cooling System with Supplemental Solar Heating ~~Supplement, and an Optional Geothermal Heating and Cooling System Water Cooled Supplement~~."

Paragraph 3:

The present invention relates to an improved in-ground/in-water heat exchange means for use in association with any heat pump heating/cooling system utilizing in-ground and/or in-water heat exchange elements as a primary or supplemental source of heat transfer~~, as well as to improved methods of installing in-ground and/or in-water heat exchange tubing.~~

Paragraph 16:

It is an object of the present invention to further enhance and improve the efficiency and installation cost functionality of predecessor geothermal heat exchange designs for closed–loop water-source heat pump systems, and for direct

expansion heat pump systems. ~~when the use of a direct expansion system supplemental refrigerant fluid pump is not desired, and when the well/borehole depth is too great for direct expansion systems to function with efficient operational refrigerant pressures (which pressures are well understood by those skilled in the art) absent the use of a supplemental refrigerant fluid pump.~~ This is accomplished by means of ~~a sealed casement within a deep borehole, within which a fully insulated open-ended pipe is placed from the top of the casement to a point near the bottom, with the top of the pipe extended to a sealed and fully insulated liquid container within which copper, or other suitable material, refrigerant transport heat transfer tubing is placed. (Utilization of a deep borehole exceeding 100 feet in depth, although shallower depths will function, is preferred so as to avoid any near surface temperature fluctuations caused by the hot/cold temperature extremes of the atmosphere above the ground surface.) The copper refrigerant tubing extends, by means of a supply and a return line, to and from a compressor, an interior air handler, and related conventional heat pump equipment, without the necessity for a defrost cycle. The container is attached to the casement and to the pipe so as to permit heat conductive liquid circulation from the bottom of the casement, through the pipe, around the copper refrigerant tubes, and back down the casement, which casement is in direct thermal contact with the surrounding sub-surface earth. Circulation of the heat conductive liquid, such as water or water and anti-freeze, is effected by a liquid pump situated within the top of the pipe. A conventional solar heat collector system is connected to the container, which provides a heat sink for~~

~~the solar system in the winter, and which provides supplemental heat to the primary geothermal system. Alternatively,~~ a solar heat collector solar system that is operatively connected to a new, or to an existing, geothermal direct expansion, or closed-loop water-source, heat pump system so as to provide supplemental heat in the heating mode, when advantageous, by means of natural solar heat collector fluid convection. ~~When operating in the cooling mode, the supply refrigerant vapor line runs through a condensate water collector in the summer, before the line enters the container, to provide supplemental evaporative cooling.~~